Application No. 10/543,005
Amendment dated May 11, 2009
Reply to Office Action of February 10, 2009

Docket No.: 1907-0227PUS1

<u>**AMENDMENTS TO THE CLAIMS**</u>

Please amend the claims as follows:

1-29. (Canceled)

30. (Currently amended) An encoding device for encoding a plurality of pieces of position information corresponding to a plurality of leaves and/or nodes at ~~the same~~a common layer in a tree structure, comprising:

a rearranging unit for rearranging, in accordance with a predetermined order relationship, the plurality of pieces of position information to be encoded,

a determining unit for determining, in accordance with the predetermined order relationship, a branch layer of two consecutive pieces of position information from among the plurality of pieces of position information output from the rearranging unit, and

an encoding unit for outputting a code corresponding to the branch layer,

wherein the plurality of pieces of position information are rational number position information represented by a rational number, and wherein the predetermined order relationship is determined by ~~the~~<u>an</u> order of magnitude of resolution of the rational number.

31. (Currently amended) An encoding device for encoding a plurality of pieces of position information corresponding to a plurality of leaves and/or nodes at ~~the same~~<u>a common</u> layer in a tree structure, the plurality of pieces of position information to be encoded being arranged in accordance with a predetermined order relationship, comprising:

a determining unit for determining, in accordance with the predetermined order relationship, a branch layer of two consecutive pieces of position information from among the plurality of pieces of position information to be encoded, and

an encoding unit for outputting a code corresponding to the branch layer,

wherein the plurality of pieces of position information are rational number position information represented by a rational number, and wherein the predetermined order relationship is determined by ~~the~~<u>an</u> order of magnitude of resolution of the rational number.

2   MRC/CSK/mmc

32. (Canceled)

33. (Canceled)

34. (Canceled)

35. (Canceled)

36. (Previously Presented) The encoding device according to claim 30, wherein the tree structure represents search information, and wherein the leaves or nodes corresponding to the plurality of pieces of position information to be encoded correspond to elements of the same type contained in the search information.

37. (Currently amended) An encoding method for encoding a plurality of pieces of position information corresponding to a plurality of leaves and/or nodes at ~~the same~~a common layer in a tree structure, comprising:

a rearranging step of rearranging, in accordance with a predetermined order relationship, the plurality of pieces of position information to be encoded,

a determining step of determining, in accordance with the predetermined order relationship, a branch layer of two consecutive pieces of position information from among the plurality of pieces of position information output in the rearranging step, and

an encoding step of outputting a code corresponding to the branch layer using an encoding unit,

wherein the plurality of position information are rational number position information represented by a rational number, and wherein the predetermined order relationship is determined by ~~the~~an order of magnitude of resolution of the rational number.

MRC/CSK/mmc

38. (Currently amended) An encoding method for encoding a plurality of pieces of position information corresponding to a plurality of leaves and/or nodes at ~~the same~~a common layer in a tree structure, the plurality of pieces of position information to be encoded being arranged in accordance with a predetermined order relationship, comprising:

a determining step of determining, in accordance with the predetermined order relationship, a branch layer of two consecutive pieces of position information from among the plurality of pieces of position information to be encoded, and

an encoding step of outputting a code corresponding to the branch layer using an encoding unit,

wherein the plurality of position information are rational number position information represented by a rational number, and wherein the predetermined order relationship is determined by ~~the~~ an order of magnitude of resolution of the rational number.

39. (Canceled)

40. (Canceled)

41. (Canceled)

42. (Canceled)

43. (Previously Presented) The encoding method according to claim 37, wherein the tree structure represents search information, and wherein the leaves or nodes corresponding to the plurality of pieces of position information to be encoded correspond to elements of the same type contained in the search information.

44. (Currently amended) A decoding device for decoding a string of position information code composed of a plurality of pieces of encoded position information corresponding to a plurality of leaves and/or nodes at ~~the same~~a common layer in a tree structure, comprising:

a storage unit for successively storing decoded position information,

a determining unit for determining a branch layer of two consecutive pieces of position information based on the position information code, and

a decoding unit for updating the value of the position information, stored in the storage unit, corresponding to the branch layer by one notch in accordance with a predetermined order relationship, wherein the plurality of pieces of position information are rational number position information represented by a rational number, and

wherein the predetermined order relationship is determined by ~~the~~ an order of magnitude of resolution of the rational number.

45. (Previously Presented) The decoding device according to claim 44, further comprising rearranging unit for rearranging the plurality of pieces of decoded position information in accordance with the order of magnitude.

46. (Previously Presented) The decoding device according to claim 45, further comprising calculating unit for calculating a serial number assigned to each piece of decoded position information, the serial number representing the order of magnitude.

47. (Canceled)

48. (Canceled)

49. (Canceled)

50. (Canceled)

51. (Previously Presented) The decoding device according to claim 44, wherein the tree structure represents search information, and wherein the leaves or nodes corresponding to the

position information to be decoded correspond to elements of the same type contained in the search information.

52. (Currently amended) A decoding method for decoding a string of position information code composed of a plurality of pieces of encoded position information corresponding to a plurality of leaves and/or nodes at ~~the same~~a common layer in a tree structure, comprising:

a storage step of successively storing decoded position information in a storage unit,

a determining step of determining a branch layer of two consecutive pieces of position information based on the position information code, and

a decoding step of updating the value of the position information, stored in the storage ~~step~~unit, corresponding to the branch layer by one notch in accordance with a predetermined order relationship using a decoding unit, wherein the plurality of pieces of position information are rational number position information represented by a rational number, and

wherein the predetermined order relationship is determined by ~~the~~an order of magnitude of resolution of the rational number.

53. (Previously Presented) The decoding method according to claim 52, further comprising a rearranging step of rearranging the plurality of pieces of decoded position information in accordance with the order of magnitude.

54. (Previously Presented) The decoding method according to claim 53, wherein the rearranging step further comprises a calculating step of calculating a serial number assigned to each piece of decoded position information, the serial number representing the order of magnitude.

55. (Canceled)

56. (Canceled)

57 (Canceled)

58. (Canceled)

59. (Previously Presented) The decoding method according to claim 52, wherein the tree structure represents search information, and wherein the leaves or nodes corresponding to the position information to be decoded correspond to elements of the same type contained in the search information.

60. (Canceled)

61. (Currently amended) A computer readable recording medium having stored thereon storing a computer program that, when executed, performsfor causing a computer to perform the encoding method according to claim 37:

a rearranging step of rearranging, in accordance with a predetermined order relationship, the plurality of pieces of position information to be encoded,

a determining step of determining, in accordance with the predetermined order relationship, a branch layer of two consecutive pieces of position information from among the plurality of pieces of position information output in the rearranging step, and

an encoding step of outputting a code corresponding to the branch layer,

wherein the plurality of pieces of position information are rational number position information represented by a rational number, and wherein the predetermined order relationship is determined by an order of magnitude of resolution of the rational number.

62. (Canceled)

MRC/CSK/mmc

63. (Currently amended) A computer readable <u>recording</u> medium <u>having stored thereon</u> ~~storing~~ a <u>computer program that, when executed, performs</u> ~~for causing a computer to perform the decoding method according to claim 52~~:

<u>a storage step of successively storing decoded position information,</u>

<u>a determining step of determining a branch layer of two consecutive pieces of position information based on the position information code, and</u>

<u>a decoding step of updating the value of the position information, stored in the storage step, corresponding to the branch layer by one notch in accordance with a predetermined order relationship, wherein the plurality of pieces of position information are rational number position information represented by a rational number, and</u>

<u>wherein the predetermined order relationship is determined by an order of magnitude of resolution of the rational number.</u>

64. (Currently amended) The encoding device according to claim 30 <u>or 31</u>, wherein each rational number is equal to a natural number over the power of 2.

65. (New) The encoding method of claim 37, wherein the plurality of pieces of position information to be encoded are retrieved from a storage unit by said encoding unit.

66. (New) The encoding method of claim 38, wherein the plurality of pieces of position information to be encoded are retrieved from a storage unit by said encoding unit.

67. (New) The encoding method according to claim 37 or 38, wherein each rational number is equal to a natural number over the power of 2.

68. (New) The decoding device according to claim 44, wherein each rational number is equal to a natural number over the power of 2.

MRC/CSK/mmc

69. (New) The decoding method according to claim 52, wherein each rational number is equal to a natural number over the power of 2.

MRC/CSK/mmc